

## PATENT ABSTRACTS OF JAPAN

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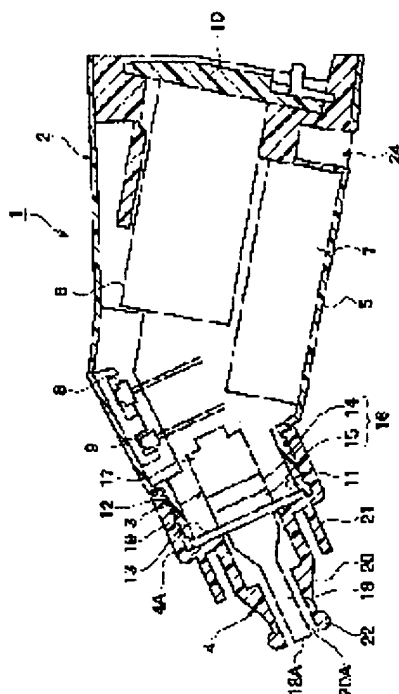
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(54) ULTRASONIC CLEANING DEVICE



(57)Abstract:

PROBLEM TO BE SOLVED: To provide an ultrasonic cleaning device of a small size and low electric power consumption which is capable of sufficiently exhibiting the effect of ultrasonic vibration and is capable of easily cleaning stained clothing, or the like, in general home.

SOLUTION: This ultrasonic cleaning device has an ultrasonic vibration section 3 constituted by successively providing an ultrasonic vibrator transducer 16 using piezoelectric substances 14 and 15 with a rear ultrasonic horn 17 and a front ultrasonic horn 18. The electric power consumption of the ultrasonic vibrator transducer 16 is set at  $\leq 8$  W. The electronic cleaning device is so constituted

that the front end faces of the ultrasonic horns are planes and that the front end areas thereof are set at 0.07 to 1 cm<sup>2</sup>. The ultrasonic cleaning device of the small size and the low electric power consumption which is capable of sufficiently exhibiting the effect of the ultrasonic vibration and is capable of easily cleaning the stained clothing, or the like, in the general home is realized by such constitution.

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- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

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**CLAIMS**

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[Claim(s)]

[Claim 1] The ultrasonic cleaner to which it is the ultrasonic cleaner which the ultrasonic vibrator using the piezo electric crystal is equipped with the supersonic-oscillation section which comes to form an ultrasonic horn successively, and a washed object is contacted to the point of the aforementioned ultrasonic horn, and washes a washed object, and the apical surface of the aforementioned ultrasonic horn is characterized by setting the apical-surface product as 2 0.07-1cm at a flat surface while the power consumption of the

aforementioned ultrasonic vibrator is set as less than [ 8W ].

[Claim 2] The ultrasonic cleaner characterized by being the ultrasonic cleaner which the ultrasonic vibrator using the piezo electric crystal is equipped with the supersonic-oscillation section which comes to form an ultrasonic horn successively, and a washed object is contacted to the point of the aforementioned ultrasonic horn, and washes a washed object, and the ratio of the area S1 in contact with the washed object at the nose of cam of the aforementioned ultrasonic horn and the area S2 of the aforementioned piezo electric crystal seen from the nose of cam side of the aforementioned ultrasonic horn being  $S2/S1 \geq 3$ .

[Claim 3] The ultrasonic cleaner according to claim 1 characterized by the flatness tolerance of the apical surface of the aforementioned ultrasonic horn being 0.2mm or less.

[Claim 4] The ultrasonic cleaner according to claim 1 or 2 characterized by forming a curved surface in the periphery of the apical surface of the aforementioned ultrasonic horn.

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